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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,698	07/25/2003	Hong-Long Chou	TAIW 155	2688

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EXAMINER

BRAUTIGAM, ALYSA N

ART UNIT	PAPER NUMBER
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2676

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/626,698

**Applicant(s)**

CHOU ET AL.

**Examiner**

Alysa N. Brautigam

**Art Unit**

2676

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>25 July 2003</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Specification***

2. The abstract of the disclosure is objected to because of the following:

- Line 3: "is developed" not necessary
- Lines 3-6: Requires rewording for clarity
- Line 8: Requires insertion "are" between "images" and "stitched"

Correction is required. See MPEP § 608.01(b).

3. The disclosure is objected to because of the following informalities:

- Page 5, Line 13: "model, images they are processed..." is unclear
- Page 5, Lines 20-21: Should be reworded for clarity

Appropriate correction is required.

### ***Claim Objections***

4. Claim 8 is objected to because of the following informalities:

- Line 16 recites the limitation "to adjust the intensities of the **rest** pixels...."

As there are no previously referenced "rest pixels," it will be assumed

Applicant meant the claim to read “the rest of the pixels” or “the remainder of the pixels.” Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

7. Claims 1 recites the following limitations:

- Line 6: States the limitation - “**converting** the image and the texture mapping to a common spatial coordinate system” where the specification only says the “same spatial coordinates have to be used.”
- Line 8: States the limitation –“**comparing** the image with the texture mapping within the spatial coordinate system...” where the specification provides no details as to comparing.
- Line 12: States the limitation – “using a **prescribed condition to select** the texture...” where the specification provides no details as to the selection step and a definition of prescribed condition.

- Line 15: States the limitation – “making the pixels...continuous...” where the specification provides no details as to the details of making the pixels continuous.
- Line 15: "the plaque" – not previously mentioned
- Line 16: States the limitation – “restoring the polygon...” where the specification provides no details as to restoration.

Claims 2-5 are similarly rejected as they are dependent on claim 1.

8. Claim 4 recites the limitation wherein the texture normalization uses the pixel intensities of the polygons in both the image and the texture mapping to compute a weighted average for adjustment. The specification provides no details as to how the image and texture mapping data are both used to compute the weighted average.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 6-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claim 6 refers to the method of claim 1 and the “step of making the pixels of the polygon texture continuous,” however claim 1 discloses the step of “making the pixels inside the plaque continuous.” Claims 7 and 8 are similarly rejected as they are dependent on claim 6.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debevec et al. ("Modeling and Rendering Architecture from Photographs: A hybrid geometry- and image-based approach") in view of Teo (6,385,349).

14. In regards to claim 1, Debevec discloses a multilevel texture processing method for mapping multiple images onto a 3D model with a texture mapping (page 17, Sections 3.1 – "View-Dependent Texture Mapping" and 3.2 "Compositing Multiple Images"), the method comprising the steps of:

- providing an image to the 3D model (page 17, Section 3.1, first paragraph);
- converting the image and the texture mapping to a common spatial coordinate system and dividing them into a plurality of polygons (page 14, left column discloses wherein "the scene is represented as a constrained hierarchical model of parametric polyhedral primitives called blocks"; page 13, eighth paragraph discloses the relationship between sections 2 and 3);
- using a prescribed condition to select the texture of one of the image and the texture mapping as the texture of the polygon (page 17, right column,

first paragraph under section 3.2 discloses “the renderer has to decide which image (or combination of images) to use”;

- smoothing the texture of the polygon (page 17, right column; second paragraph under section 3.2 discloses “smooth[ing] these transitions”; page 18, left column, second full paragraph discloses the smoothing for a polygonal shape);
- making the pixels inside the plaqueette continuous (section 3.2, paragraphs 3 and 5 disclose the smoothing processing through a weighted averaging applied to the pixels where the smoothing process causes the pixels to appear continuous by “removing discontinuities”); and
- restoring the polygon and outputting the 3D model (page 18, left column, second full paragraph discloses the restoring of the polygon and rendering of the model).

While Debevec discloses the method of multilevel texture processing method for mapping multiple images onto a 3D model with a texture mapping including comparing the image with the texture mapping within the spatial coordinate system and extracting overlapped polygons (page 14, right column discloses the use of the world coordinate system; page 17, right column, second column under section 3.2), Debevec does not specifically disclose wherein using the pixel intensity of the overlapped polygons to compute a statistics mean for adjusting the pixel intensity of the image accordingly. Teo discloses a system and method for merging a plurality of images which overlap wherein using the pixel intensity of the overlapped polygons to compute a statistics mean for

adjusting the pixel intensity of the image accordingly (Figure 7C; column 10, lines 21-46; column 15, lines 44-56). It would have been obvious to one skilled in the art to which it pertains at the time the invention was made to integrate the teachings of Debevec and Teo to achieve a system and method in which multiple images are merged and in which the intensity of the overlapping regions is used to modify the intensity of a single image in order to provide a single image having a consistent brightness and thus avoid visual artifacts associated with different lighting parameters.

15. In regards to claim 2, the combination of Debevec and Teo discloses the method of claim 1, as contained hereinabove. In addition, Debevec discloses wherein the prescribed condition is selected from the group consisting of resolution, polygon orientation, and camera viewing perspective (page 15, right column, paragraph beginning "Fig. 6(a) shows how a ...position of the camera...").

16. In regards to claim 3, the combination of Debevec and Teo discloses the method of claim 1, as contained hereinabove. In addition, Debevec discloses wherein the step of smoothing the texture of the polygon includes texture normalization and texture blurring (page 15, right column, paragraph beginning "Fig. 6(a) shows how a..." where the normal vector is calculated).

17. In regards to claim 4, the combination of Debevec and Teo discloses the method of claim 3, as contained hereinabove. In addition, Debevec discloses wherein the texture normalization uses the pixel intensities of the polygons in both the image and the texture mapping to compute a weighted average for adjustment (Figure 12).



18. In regards to claim 5, the combination of Debevec and Teo discloses the method of claim 3, as contained hereinabove. In addition, Debevec discloses wherein the texture blurring uses the textures of the polygon and its neighboring polygons to compute a weighted average for adjustment (page 17, right column, bottom paragraph disclose the use of the pixel and its neighboring pixel for the weighted averaging where Debevec has previously disclosed the use of polygons for this purpose).

19. In regards to claim 6, the combination of Debevec and Teo discloses the method of claim 1, as contained hereinabove. In addition, Debevec discloses wherein the step of making the pixels of the polygon texture continuous is achieved by mixing colors with the neighboring polygons (page 17, right column, first paragraph under section 3.2 discloses the mixing of colors; page 17, right column, bottom paragraph discloses the mixing of colors with neighboring pixels where Debevec has previously disclosed the use of polygons for this purpose).

20. In regards to claim 7, the combination of Debevec and Teo discloses the method of claim 6, as contained hereinabove. In addition, Debevec discloses wherein the step of mixing colors includes the steps of:

- extracting a pixel on the border of the polygon with discontinuous colors (page 15, right column, paragraph beginning "The projection of the line onto the image..."); and
- computing a weighted average of the intensities of the pixel and its nearest neighboring pixels as a new intensity of the pixel (Figure 12).

21. In regards to claim 8, the combination of Debevec and Teo discloses the method of claim 7, as contained hereinabove. In addition, Debevec discloses wherein the step of computing a weighted average of the intensities of the pixel and its neighboring pixels as a new intensity of the pixel is followed by the steps of:

- computing the difference between the weighted average intensity and the original pixel intensity (Figure 12); and
- using the pixel intensity difference to adjust the intensities of the rest pixels inside the polygonal texture (Figure 12 and page 17, right column, bottom paragraph).

### ***Conclusion***

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Weinhaus et al. ("Texture Mapping 3D Models of Real-World Scenes") presents a detailed overview of multiple techniques for texture mapping using 3D modeling. Debevec ("Rendering Synthetic Objects into Real Scenes: Bridging Traditional and Image-based Graphics with Global Illumination and High Dynamic Range Photography") discloses further application of the techniques used to account for lighting differences in the merging of multiple images into a single scene.

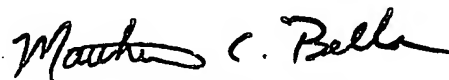
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alysa N. Brautigam whose telephone number is 703-305-8631. The examiner can normally be reached on 8:00 am - 4:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on 703-308-6829. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

anb

A handwritten signature in black ink, appearing to read "Matthew C. Bella".

MATTHEW C. BELLA  
SUPERVISORY PATENT EXAMINER  
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